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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/866,129	05/30/97	UEMURA	T 238641-F97-1

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EXAMINER

WILLE, D

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 08/19/98

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/866,129

Applicant(s)

Uemura et al.

Examiner

Douglas Wille

Group Art Unit

2814



☒ Responsive to communication(s) filed on Jul 16, 1998

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-19 is/are pending in the application.

Of the above, claim(s) 15-19 is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-14 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2814

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 12 - 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al.('422)

3. Nakamura et al.('422) show a group III compound semiconductor device (see Figure 1) with a p-type upper layer 13 and an electrode consisting of a layer of Ni with a layer of Au on top (column 5, line 49). Figure 7 shows a modification of the Figure 1 device which has a contact layer 15 and a bonding pad 17 that covers part of layer 15 and has a protective film of silicon oxide (column 10, line 26). The other properties in claim 12 are inherent in the materials.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 2814

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 - 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al.('422) in view of Manabe et al. and Nakamura et al.('350).

6. Nakamura et al.('422) show a group III compound semiconductor device (see Figure 1) with a p-type upper layer 13 and an electrode consisting of a layer of Ni with a layer of Au on top (column 5, line 49). Figure 7 shows a modification of the Figure 1 device which has a contact layer 15 and a bonding pad 17 that covers part of layer 15 and has a protective film of silicon oxide (column 10, line 26). Nakamura et al.('422) also show that the bonding pad 17 is composed of Ni and Au but teach against the use of Al (in a two layer structure) since it can migrate to the electrode and can degrade it. Manabe et al. show the use of Al in a multilayer electrode stack (see Figure 6 and column 5, line 38) which has improved operating characteristics. It would have been obvious to modify the Nakamura et al.('422) device to include the Al layer as taught by Manabe et al. with the expectation that the two intervening layers will protect the electrode from deterioration. Nakamura et al.('422) also teach annealing at 600 degrees (column 7, line 38) and teach the LED compound is  $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$ . Nakamura et al.('350) show that the silicon oxide protective layer is  $\text{SiO}_2$  (column 34, line 66). The remainder of the claimed features are inherent in the choice of materials. Forming the layers in the sequence Ni-Au-Al follows the decreasing sequence of work functions and would also be obvious.

Art Unit: 2814

*Conclusions*

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.

8. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.



Olik Chaudhuri  
Supervisory Patent Examiner  
Art Unit 2814

DAW /fkc

August 13, 1998